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April 3d.

MR. CASSIN, Vice-President, in the Chair.

Twenty members present.

The following was offered for publication: Observations on *Chætetes*, etc." By C. Rominger, M. D.

April 10th.

MR. VAUX, Vice President, in the Chair.

Twenty-nine members present.

A letter was read from Dr. G. Lincecum, of Texas, containing a history of the "small black erratic ant," as follows:

The small black, crooked running ant, so common in everybody's yard, and on almost every growing twig in spring time and summer, is called, in my catalogue of ant species, the erratic, or crazy ant. He is No. 5 in my notes on the various types of ants. In this species, the formic acid odor is very strong when the ant is crushed. He is quick in his movements, does not make paths, but travels in scattered files, in the same direction, sometimes several hundred yards; moves quickly on a general course, running very crooked the whole route, giving his path a broad range, travelling two or three times the distance to his place of destination. All along the range of their path, at unequal distances, are depots or station-houses, at which they often call as they pass along, giving the whole affair quite a business aspect. Or it may be that what I have denominated depots or station-houses, will turn out, on a more careful investigation, to be a line of regularly constituted and well organized confederate cities, among which there is carried on a rapid and extensive commerce. At any rate, there can be no doubt of the fact that they are engaged in an extensive and well-established, reciprocal intercourse throughout the entire line of their cities. Cripple one of them on the route of his travel, and you produce the wildest excitement, and the invalid will be visited and examined by perhaps 500 of the travelling throng in the course of two or three minutes. If the case is a curable one they work with him until he is on foot again, when he moves onward with the crowd as before. If he dies, they remove him from the range of the great thoroughfare, and business rolls on again.

They sometimes wage war with the red-headed tree-ant, (he is the No. 4 of my catalogue, and may be fully described in some future article), and the conflict is generally quite disastrous. Notwithstanding the fact that they are always able to bring to the field more than ten times the number of their red-headed foe, they often meet with defeat.

I was spectator to a battle, or rather a field fight, between these two species of ant, that continued four or five hours. Small parties were engaged in the deathly conflict at sunrise, when I first observed them. They were fighting in the wagon road, and their numbers were rapidly increasing. At the time I was called to breakfast, they were in considerable force on both sides, and when I returned I found both armies greatly augmented. Reinforcements were constantly arriving, and the battle was raging over an area of eight to ten feet in diameter. The discipline and modes of battle of the two species are entirely different. The method of attack, by the little black ant, is aimed altogether at the feet and legs of the foe; and as they greatly outnumber the red heads, by engaging them two or three to one, they succeed in maiming and rendering large numbers of them unfit for service. The red heads seem 1866.]

to aim only at decapitation, and this they accomplish with dexterity and surprising facility. Reinforcements were momentarily arriving to both armies. Thousands were already engaged, and the bloody strife was raging over the entire area of the battle-field.

Being controlled only by two forces,—desperation and death—the scene was terrific beyond my powers of description. In all directions, everywhere, were seen the dire effects of relentless war. The battle-field was already thickly strewn with the dead and dying, over whom, in regardless tramp, swept the furious antagonism. Here indeed was, for once, at least, full manifestations of the unmistakable, genuine “tug of war.” Violently struggling and gnashing their jaws; clinging together and wallowing on the ground, in companies, in squads and single combat, the direful contest fiercely raged. Dispatches had been sent off by the black ants for their entire reserve to be forwarded immediately, and they were pouring out by the million from the gates of their great city,—distant about 60 feet,—and hurrying toward the battle-field. They were evidently making a forced march, and their numbers were so great, that by the time they had progressed 20 to 30 feet, their line of march suggested the idea of a broad black ribband trailing on the ground, and there seemed to be no end to them, for they were still flowing out from the city in countless thousands.

At this crisis their army on the battle-field gave way and was routed, and in a general panic commenced a retreat. Soon, in their disorderly flight, they met their reinforcements and communicating to the front ranks their total and disastrous discomfiture, the panic became universal, and reinforcements and all fled precipitately into the city. In five minutes there were no black ants to be seen above ground. The news of the great battle and its disastrous results seemed to have been spread around to those even who had not been engaged in the battle, but who were busied in their daily avocations. At all events, from some cause the black ants immediately disappeared entirely from the top of the earth in that vicinity. Not so on the battle-ground. The victors occupied the ensanguined field, and were busily employed for several hours. Many of them were attending to the wounded, which were numerous, and whom they carried into the shade of a large clod of earth, that had been turned up by some heavy road wagon, to get them out of the scorching sunshine, which was pouring down in great force, it being now nearly 11 o'clock. Much the larger portion of them were gathering up and packing off the decapitated bodies of the black ants, and carrying them up a post oak tree, in which they had their city, and which also stood near by. Upon these headless victims of the bloody strife they intended, as I supposed, to have a grand feast.

There was a great running to and fro by those who were attending the wounded. They seemed to exert themselves greatly and to manifest much sympathy for them. In the course of an hour many of the wounded were so far recovered as to be able to travel, while those who remained invalid were carried up the tree by their friends. Although great numbers of the red-heads were wounded, and some of them seriously, there were but few dead ones, and these were carried up the tree with the headless trunks of the conquered foe. After the victorious red-heads had left the battle-field, the only signs that remained to mark the place of the destructive contest was the dis severed heads of the vanquished. Of these there were so many that they suggested the idea of gunpowder strewed along the ground.

The food of this species of insect is various. He is quite fond of vegetable oils, sweet saps and honey. He collects his sweets from the tender buds and glands and blooms of plants, and in great quantities from the aphids—vine fretter or plant louse. These plant lice have their inflected beak inserted in the tender bark of the buds and twigs of the growing plants, vines and the like, where, in dense crowds they cling, sucking the sweet sap. Among these masses of plant lice is ever found great numbers of the erratic

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ants, carefully and gently walking through the ranks of the sap-sucking pests ; busily engaged in licking up the honey dew, which is nothing more than the transparent excrementitious fluid, that is momentarily dropping from the countless aphides. To facilitate the process of collecting these precious sweet drops, the ant caressingly applies its antennæ to the bloated sides of the plant louse, who obligingly turns up his tail and delivers the sweet little transparent drop, which is thankfully received and licked up by the polite little teaser. From observations on this peculiarity in the character of the erratic ant, have originated the occasional accounts we have seen published in the newspapers about the ant's milk cows. As far as my observation goes, the erratic ant is the only one of the genus that visits and collects the excrementitious droppings of the aphids.

Besides the great quantities of food collected from the aphids, or plant lice, by these courageous and extremely industrious little creatures, the oak family of trees affords them large supplies. The post oak (*Quercus obtusiloba*) and the black-jack (*Quercus nigra*) particularly. They will travel a long distance from home to visit a thrifty-growing tree of either of these oaks. And, as these trees yield their supplies all the time of the green foliage, they generally establish a chain of depots along the line of travel, from their nearest city to the food-giving tree. Or it may be, that finding the selected tree capable of supplying food for great numbers, they have, instead of depots, extended their cities along the range of the great thoroughfare, and thus, by the addition of city after city, strengthen the confederacy, and increase the facilities for procuring provisions for their great and extended realm.

This is no fiction, or fancy sketch, in the history of the contrivances of these thoughtful little emmets. It is sometimes a hundred yards or more from the mother hive, or city, to the tree that their commissaries have selected ; and at various distances along the road, they do erect new establishments, at first, thinly scattered on the route, which are, however, seen to increase annually all the way to the tree, if it remains alive,—and these are either depots, places of deposit for their surplus accumulations of their stores of provisions, or they are confederated communities. Be it either way, the fact that they are carrying on a well-regulated and thoroughly-understood system of friendly, reciprocal intercourse cannot be denied ; that is, as far as any one line of depots, or cities, as I prefer to call them, are concerned.

Coming across any one of their great thoroughfares we find them streaming along in both directions. Take either end of this road, and you may trace it to its terminus. It may be some distance, but you will find it if you persevere, either in a terminal city, or a live tree ; and that it is not connected with any other range of cities, (I prefer the term cities), which, as I think, further and more careful investigation will decide these peculiar ranges of ant nests to be.

In large towns and cities constructed by the human species, where they have cut down and destroyed the forests, these sagacious little ants would have to evacuate such places, if they possessed no reasoning powers to enable them to adapt themselves to other conditions and circumstances. The ant finds that the march of civilization has crushed out and destroyed all his resources for subsistence ; and viewing arrogant man as the prime cause of this great loss, he quickly decides to hold him accountable, and force him to make good the damage. To effectuate this grand retaliative resolve, he forthwith transports his eggs and young ones, with their nurses and teachers into the intruder's kitchen, into the little crannies and cracks, in the timbers about the dairy and dining apartment, and particularly beneath the hearths in the dwelling. In these newly-established homes they become more thrifty than they were while in a natural state. Finding provisions abundant and very convenient, they are encouraged to labor more, and they increase at a ratio unprecedented. Soon their numbers are so great that they are to be seen in 1866.]

all portions of the house, sucking and carrying away every thing greasy or sweet that is not hermetically sealed. They cut and destroy window curtains and articles of clothing that are starched.

One way to destroy the erratic ant, is to lay out a greasy rag or recently laid aside greasy bone. By either of these experiments multitudes of them will be attracted, and when sufficient numbers of them have collected on the bait, hold it in the flame of burning shavings or other quick combustible, repeating the experiment frequently. But if the bone or rag be left undisturbed, it will not be long until they have extracted every particle of the oil from it; and should there be any scraps of flesh remaining on the bone when it is cast aside, it will be found that in a short time, they have cut the flesh to pieces, and after extracting the oil it may have contained, dropped it down in the form of dry powder, showing conclusively that they do not subsist on flesh, or dry food. They treat the kernels of any of the oily nuts in the same way. Hence I conclude that they subsist on a fluid diet, and that they, like the honey bee, are provided with an internal sack, or pouch, in which to transport their stores to the cities.

This day, 22d August, I observed the erratic ant in great numbers, carrying something in their mouths, and, as it was a visible something they were packing home, I was curious to know what it might be. So I robbed a couple of them of their freight, which, on being exposed under the microscope, turned out to be the carcass of the smallest—almost microscopic—black ant, the No. 7 of my catalogue. After making this discovery, I examined quite a number of them, and found the abdomen of all alike torn open and emptied—disembowelled. They were bringing them from beneath the cook house, where the poor little fellows had been filling themselves with waste syrup that had been spilled there. This circumstance had been discovered by some of the spies of the erratic ants, and now, as it had been licked up by the little ants, there was no way left for them to possess themselves of the rich treasure but to wage war upon the smaller ant, and tear it out of their full sack. And this they had already accomplished before I discovered them, and were now carrying home their lacerated carcasses, to have them sucked and dried of their blood and other contained fluids.

This type of ants is very numerous, courageous, and exceedingly thrifty and belligerent. He will engage in battle with any of the other types. They occasionally succeed in capturing the large, red, agricultural ant. (*Myrmica molefaciens*, S. B. Buckley.) I did not know then how they had managed to take him; but they had one of these big red fellows very secure when I first discovered them, and were making a great parade around him. They were clinging two or three to every leg of the large ant, and great numbers were parading and ranting on each side of the road, as they slowly and laboriously moved along with their giant captive, who seemed to be not only in great distress, but very loathe to be carried in the manner and the direction they were so unceremoniously dragging him along. The little black warriors had already deprived him of two or three of his feet, and they were sawing away at the remainder of his legs and feet, whilst he was clinging with his large jaws to a piece of oak leaf; and that the little black fellows were hauling him, leaf and all, to some terrific fate, was manifested by the prisoner in all his actions. I had not time then to wait and see how the affair terminated. Since that case, however, I have witnessed a good many similar ones. It occurs quite frequently.

The agricultural ant, in his foraging excursions, travels over a wide range, and will not turn his course for anybody. So, when in his course, he falls into a range of confederate cities of the erratic ant, he walks on as carelessly among them as if there was no one at home; and, as a general thing, the sagacious little braves suffer him to pass unmolested, paying but little attention to him. But sometimes he meddles too much, and, putting on airs, contrary to their notions of propriety, they consider it a national insult, and

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instantly, all that portion of the confederacy are up in arms. Large companies attack him forthwith. It is, however, always a dangerous experiment, and very often results in failure. At the best, there is to the erratic ant, in these cases of daring, great loss of life. When they make the attack, the giant intruder, at first, seems to regard it as an affair of a trifling nature, and with but little concern, strikes about amongst his diminutive assailants without any apparent anxiety. He occasionally snatches up one of the most venturesome, and, as if to frighten the rapidly-increasing hordes, or to show off his great strength, he breaks the backs or heads of half a dozen or so, but does not kill near as many as he might.

The news of this giant invader of the confederacy soon spreads to every city, each of which sends out its quota of warriors; and it is surprising to note how promptly and with what haste they stream along on the road to the troubled city. The field around the red monster begins to blacken with the accumulating regiments of the invaded nation; and now, when it is too late, the great red monster begins in earnest to crush and slay every one that comes in range of his death-dealing jaws; and, by means of his great strength and power to crush and destroy every one upon whom he can clamp his ponderous jaws, he often succeeds, with the loss of one or more of his feet, perhaps, in extricating himself from the dangerous thraldom. But more frequently, the daring little blacks pitch into the strife in such multitudes, and seizing him by every foot, and leg, and horn, and weighing him down by their numbers, overturn him, clip off his feet, gnaw at his throat, saw at his waist, and, finally, in the course of half a day, succeed in rendering the giant foe harmless. And now, with a grand display of their numbers, they drag the now helpless victim about in triumph for a time, and then as many as can get a hold of the dying red ant pierce him in the joints of his coat of mail, and suck from his trembling, agonizing, prostrate body all the vital fluids, leaving the perfectly-dry skeleton on the plain, as a warning to all such adventurous intruders.

About the first of October, or as soon as the atmospheric temperature begins gradually to lower, the thoughtful little erratic ant, who is, indisputably, a practical meteorologist, goes diligently to work, deepening his habitation. A knowledge of the meteorological indications obtains with all the species of the ant genus. Hence, we find that, during the summer season, they throw out from their cells only black dirt—soil; then they are excavating apartments near the surface, both for convenience to the foraging laborers, whose duty it is to bring in the supplies, and to obtain a higher temperature for the purpose of hatching and nurturing the young. But, as soon as the signs of approaching winter supervene, we see them throwing up clay, and, among the larger types of the genus, borings of the limestone rock, even. Thus we learn that they are preparing cells or apartments at a greater depth. With a perfect knowledge of their physical powers of resistance to the atmospherical changes which are to take place during the winter, they construct their winter quarters. Accordingly, if we take pains to ascertain the truth by examining the facts for ourselves, we shall find them excavating their winter apartments at a depth below the line of change—to where the temperature is uniform at about 48° Fahrenheit. Here, with the addition of the vital warmth of the swarm, the temperature of their winter quarters maintains an uniform heat of about 69°. In this the community remains comfortable and active throughout the season of inclement weather.

16th March, 1862. This was quite a gala day with this species of ant. At all their holes everywhere in this vicinity, might be seen great numbers of their diminutive, white-winged queens frisking about, around the entrance to their cities, in a very antic style. All the drones, or male ants, were out, too, running very rapidly to and fro, chasing the queens, who suffered themselves to be overtaken, receiving the embrace of their lovers quite naturally and very often. Many of the neutrals were out also, who were engaged in trans-
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porting their eggs and young ones, in all stages of growth, from one hole to another, running rapidly with the tender, maggot-like looking things, to prevent them, as I thought, from being injured by the sun, which was hot for the season. Others, again, who were not carrying the young, would dash up behind the nearest queen, and, in a playful manner, seize her by the extreme tips of her folded white wings with his calliper-like mandibles, raise her from the ground, and rush headlong into the nearest hole with her. The queens did not seem to relish this piece of rudeness, but they submitted to it with good grace, and soon came frisking back to their lovers again. I saw hundreds of them carried forcibly into their holes, in the same playful style, by the workers, who, not unfrequently, snatched them rudely from the embrace of the males. The males or drones of the erratic ant, unlike most of the other species, have no wings; on which account it becomes necessary for the queens to receive their embraces previous to taking their flight, which they all do instantly, after they are satisfied with their lovers.

The queens or mother ants of this species are not more than half the size of the workers and nurses of the cities to which she belongs. She is not so large as a small flea, and yet she takes her aerial voyage alone, and, if the wind is strong, she may continue her flight many miles. When she descends to earth again, she immediately cuts off her wings, which are no longer useful, and goes to work to establish a new city.

Just think of the great powers possessed by this small, almost microscopic insect. Let us recount some of her known attributes. Poised on her tiny white wings, all alone, and charged as she is, in embryo, with myriad nations and kingdoms of her species, destined to flourish and perform their parts on the future life stage, in the grand conflict for subsistence, confidently commits herself to the swift winds, and, while in search of her new home, she continues her aerial flight, perhaps, for hundreds of miles. She lights at last, however, and, cutting away her wings, which are no longer necessary, commences the work of excavating and preparing cells and apartments for the coming generations. And now, supposing it to be true, that this is the only ant of that species on the face of the globe, such is her wonderful prolific powers, that it would require but very few short years for her to reproduce, and fill our yards, and paths, and hearths, and sugar barrels, as thickly with the countless millions as we now find them.

The deaths were announced of the following members: Mr. Augustus Fiot, of Bethlehem, April 5th, and Mr. Robert E. Griffith, and Col. Robert Carr, Correspondent.

April 17th.

MR. VAUX, Vice-President, in the Chair.

Twenty-six members present.

The deaths were announced of the following members: Mr. John P. Crozer, March 11th, and Mr. Roland E. Evans, April 14th.

April 24th.

MR. VAUX, Vice-President, in the Chair.

Thirty-one members present.

The following gentlemen were elected Members: Mr. John B. Parker, Joseph Thomas, M. D., Mr. Josiah Hoopes, Mr. Charles [April,